work of the Coast and Geodetic Survey. The initial point on the 141st meridian, which is also being marked by monuments, was determined by a telegraphic longitude circuit extending overland from Vancouver through Canadian territory, and by way of Seattle and the United States Government cables to Valdez, and thence overland to the boundary.

"A Living Representative of the most Primitive Ancestors of the Plant Kingdom," Dr. G. T. Moore. Chodat has derived the green algæ from the Palmellaceæ. In this family he points out that there exist three principal stages or conditions:—(1) the zoospore condition; (2) the sporangium condition; and (3) the tetraspora condition. The author thinks that a better starting point is found in Chlamydomonas, which also shows three corresponding conditions in addition to the zoospore type, namely, the volvex type, the tetraspora type, and the endosphæra type. The tetraspora type of Chlamydomonas has developed into the Palmellaceæ, and thence into the algæ and higher green plants. Even as high as the mosses and ferns a Chlamydomonas stage is to be seen in the male gamete.

"The Explosion of the Saratoga Septic Tank," W. P. Mason. The explosion of a tank used for the storage of sewage, and supposed to be due to the ignition of an explosive mixture of marsh gas and air, is discussed. The marsh gas is derived from the fermentation of the sewage, and the ignition is assigned to the generation of phosphine, which is supposed to have ignited spontaneously.

"Some Chilean Copper Minerals," Prof. H. F. Keller. The author describes a number of rare minerals containing copper from the mines in the province of Tarapaca, Chile. Among them the most interesting are peloconite, a manganese ore containing a considerable proportion of copper; a new double sulphate of copper and magnesium isomorphous with chalcanthite; and a beautifully crystallised sulphate and arsenate of copper, which could not be identified with known species.

"Absorption Spectra of Solutions," Prof. H. C. Jones. The object of the present investigation was to ascertain whether combinations between the solvent and dissolved substance had any effect upon its power to absorb light. Certain salts in the anhydrous state have very different absorption than when combined with water. A solution of anhydrous neodymium chloride in absolute alcohol gives absorption bands differing from those obtained when a few per cent. of water is added. The application of this observation to the author's theory of hydration is discussed.

"Effect of an Angle in a Wire Conductor on Spark Discharge," Prof. F. E. Nipher. The problem to be solved is to determine the real current direction in a wire through which a spark discharge is passing. The spark discharge was that of a long eight-plate machine. One terminal was grounded on a water pipe, the other was grounded in the air. A small wire bent at a sharp right-angle was placed vertically in the lines of the earth's magnetic field, and so connected that the negative discharge could be sent either up or down around the angle, and its effect recorded on a photographic plate placed under the angle. Very interesting photographic results were obtained, but the author does not consider that the main question was conclusively answered.

"Some Results of the Ocean Magnetic Work of the Carnegie Institution of Washington," Dr. L. A. Bauer. Dr. Bauer described the work of the *Galilee* expedition in the Pacific since August, 1905. The work accomplished, briefly stated, is as follows:—(*a*) magnetic observations have been made on the ocean areas which closely approach land observations in accuracy; (*b*) errors found in magnetic charts of the Pacific Ocean amount to 1° to 5° in declination (or variation of the compass) and in dip, and about 0·04 in the horizontal magnetic force. The correction of such errors, especially the error in declination, is of great importance for the safe and rapid navigation of vessels.

"The Investigation of the Personal Error in Double-star Measures which Depend on the Position of the Angle," Eric Doolittle. This paper gives the result of the determination of the constant personal errors, and also of the probable uncertainty of the measures of double stars made during the past ten years at the Flower Astronomical Observatory of the University of Pennsylvania.

"Relative Advantages of Various Forms of Telescopes for Solar Research," Prof. G. E. Hale. Prof. Hale discussed different types of telescopes for solar research, describing particularly the equipment at the solar observatory of the Carnegie Institution at Mount Wilson, California. The advantages of the fixed horizontal telescope with heliostat were pointed out. The author also described the large spectroheliograph of this observatory, and exhibited a number of examples of photographs taken by means of this instrument, including solar prominences, faculæ, and sun-spots.

"Photographs of Daniel's Comet," Prof. E. C. Barnard. The comet was photographed on thirty-eight nights with the Bruce photographic telescope of the Yerkes Observatory. The photographs showed that the most active period in the comet's history occurred nearly a month before perihelion, at which time changes occurred so rapidly that the appearance of the comet changed from night to night. Indeed, on comparing the Yerkes Observatory photographs with photographs made at M. Flammarion's observatory in France and at the Lick Observatory on the same night, marked differences in the photographs could be seen.

SOME RECENT AGRICULTURAL PUBLICATIONS.[1]

(1) A CONSIDERABLE change has come over the Journal of the Royal Agricultural Society during the last few years. Founded in 1839, its earlier numbers contained many papers of great scientific and practical interest, and the student of agricultural science frequently has occasion to refer back to them for the writings of Daubeny, Pusey, Way, Lawes and Gilbert, A. Voelcker, and others of the great masters who contributed some of their best work to its pages. It cannot be said that recent numbers are up to the high standard of the older ones. Several causes have contributed to bring about this result. The journal only appears once a year, and men are often unwilling to hold back their papers from publication for so long a period. Much of the work done at the various colleges is directly or indirectly financed by county councils, who like to see something for their money; the results are therefore issued as separate bulletins by the councils or colleges concerned, and distributed among the farming community. Recently, too, some very vigorous competitors, including the Journal of the Board of Agriculture and the Journal of Agricultural Science, have arisen, and these publish much of what would, in the past, have found its way to the Royal Agricultural Society's Journal. The present volume is smaller in size even than the first one issued nearly seventy years ago! There has been a considerable change in the character of the papers. The original paper has almost disappeared; there is, for instance, in this volume not a single contribution from the various teaching centres, if we exclude the report of the zoologist and Mr. Archibald's notes on certain birds, while Rothamsted only contributes a short note. Instead, the papers are of a "practical" or a text-book nature; they describe accepted good practice on certain matters, or give information which could be found elsewhere if the reader knew where to look for it. There is much to be said for this, and the utility of some of the papers in the present volume is beyond question, but it is doubtful whether this is quite the best line to take up. The journal would almost certainly be more valuable to the practical man if it aimed at furnishing him with a record of the progress of agricultural knowledge in its various branches so that he could apply the newly discovered facts to his own methods, if he thought he would gain thereby, and be in possession of definitely established principles to guide him whenever it became necessary profoundly to modify his practice, as happened to many of the wheat-growers a generation ago, and is happening to the hop-growers now. Such a record would include a critical survey of the numerous county council feeding and

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[1] (1) The Journal of the Royal Agricultural Society of England, vol. lxviii. (1907.)

(2) Bulletins 1 to 8 of the Midland Agricultural and Dairy College (Field trials in 1907).

(3) Results of Experiments at the College Farm, 1907, University College, Reading.

(4) Bulletin No. 7 Armstrong College, Newcastle-upon-Tyne.

(5) Field Experiments in Staffordshire and Shropshire for 1907.

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manurial trials, of progress in soil management, plant breeding, in bacteriology, in our knowledge of plant and animal requirements, so far as practical agriculture is concerned, besides dealing with questions of cost and with practical methods ascertained to give good results and worthy of wider trial.

To come, however, to the actual papers. Two on pigs deal respectively with the general problem and with the bacon-curer's requirements in a way that will appeal to the practical man. Mr. Archibald completes a series of notes on wild birds begun in the journal for 1892 and continued in the 1894 number; if these could be bound up into a separate booklet they would doubtless prove very attractive to the agricultural community. The report on the prize farms in Lincoln is a valuable revival of a practice discontinued since 1892; some of the best things in the literature of practical agriculture are found in the old reports. Mr. Güssow's article on poisonous plants is of interest both to botanists and to practical men.

Dr. Voelcker's report on the work carried out at Woburn is as interesting and suggestive as usual. In the pot-culture station, lithium salts have been found to be very poisonous to wheat, as little as 0·05 per cent. reducing the yield to one-quarter, whilst manganese and iron salts increased the yield. A connected account of the work is promised, and will be awaited with interest. In the field experiments it has been thought desirable to alter the scheme of manuring consistently adhered to since 1876, and we cannot help thinking that this is a great mistake. Stackyard field is one of the best experimental fields in the kingdom, and would prove an almost ideal place for solving problems in soil physics and in soil bacteriology when the methods of working are sufficiently developed. Manures take so long to act on the soil, and we know so little about the action, that it would surely have been better not to break the continuity of treatment, but to leave the fields as material for future workers just as is being done at Rothamsted.

(2) to (5) These bulletins are typical of much of the work executed under the auspices of county councils. The field trials fall under two heads, variety and manurial trials; in the former a number of the varieties of a plant are grown to see which gives the biggest yield, in the latter a scheme of manuring is designed to test the effect of the various fertilisers. Properly executed with duplicate plots and accompanied by adequate chemical analyses, the manurial trials are capable of furnishing results both of practical and scientific interest. Without soil analyses the results have only a temporary value, and are, indeed, often useless to those who do not know the actual field on which the trial was made. Although no analyses are recorded in the bulletins, it is to be hoped they exist. The Midland College bulletins speak well for the energy and enterprise of the staff. Some refreshing departures from the conventional *motif* are found in the Reading report, the experiments on weeding and on cultivation being particularly interesting.

E. J. R.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Public Orator, Dr. Sandys, spoke as follows in presenting to the Chancellor the five representatives of mathematics and natural science who received the degree of Doctor in Science *honoris causa* on June 17:—

THE HON. CHARLES ALGERNON PARSONS, C.B., F.R.S., Honorary Fellow of St. John's.

Regiae Societatis praesidis, Astronomiae fautoris maximi filius, quem hodie decoramus, etiam in ipsa pueritia machinarum novarum inventor felix fuisse dicitur. Postea Dominae Margaretae Collegii alterius scholaribus adscriptus, honorum mathematicorum in classe prima, Dominae Margaretae in nave prima, locum insignem est adeptus. Deinde Archimedis aemulis hodiernis additus, non grammophoni tantum tubam terribilem sonitus suaviores edere docuit, sed etiam navium vi vaporis impulsarum more novo movendarum opus difficillimum exitu prospero est aggressus. Machinae genus illud novum, a Societate Regia numismatis aurei honore approbatum, etiam navibus maximis oceanum transeuntibus postea est accommodatum. Quod si Neptunum ipsum alumni nostri de meritis interrogare volueritis, sine dubio Neptunus ipse protinus respondebit:—

Experto credite quantus
Per pontum properet, quo turbine torqueat undas.

SIR ANDREW NOBLE, Bart., K.C.B., F.R.S.

Ballistarum scientiam hodiernam baronetti huius ingenio plurimum debere inter omnes constat. Milites nostri, machinarum bellicarum in apparatu neque terra neque mari rerum novarum cupidi, viri huius praesertim consiliis admoniti, meliora didicerunt. In ballistis vero nostris in melius mutandis, atque etiam imperii Iaponici in navibus aedificandis, nemo Archimede nostro venerabili plus effecit. Nemo operariis nostris cessantibus et mercedem maiorem flagitantibus potiora suasit. Quid autem est praeclarius quam honoribus perfunctum senem posse dicere idem quod apud Ennium dicat ille Pythius Apollo, se esse eum unde sibi et populi et reges et omnes sui cives, summarum rerum incerti, consilium expetant?[1]

SIR WILLIAM CROOKES, F.R.S.

Cancellarii nostri auspiciis nunc demum eum ipsum praesentem videmus quem diu desideravimus, quem alia ex alia scientiarum in studiis occupata Societas praesidem suum olim suspexit. De scientia chemica et physica explorata per annos plus quam quinquaginta praeclare meritus, in rerum primordiis primis spectri (ut aiunt) auxilio examinandis eam ipsam provinciam feliciter exploravit, quae etiam scientiae physicae in officina nostra maximo cum fructu indagata est. In observando quam acutus est, in experiendo quam peritus, in rebus difficillimis investigandis quam pertinax! Viri tanti exemplo Vergili dictum denuo praeclare confirmatum est:—"Labor omnia vicit improbus."

PROF. HORACE LAMB, F.R.S., Late Fellow of Trinity Professor of Mathematics in the Victoria University Manchester.

Abhinc annos septem et triginta Newtoni in Collegio alumnum nostrum Newtoni disciplinam perquam feliciter coluisse constat. Postea in Australia professor nominatus, in colonia nostra remotissima studiorum mathematicorum, studiorum physicorum, diu duratura posuit fundamenta. Deinde scriptorum eius propter merita insignia a Mancuniensibus domum revocatus, ea quae ipse de vi electrica disputationum suarum in regione pura invenerat, ab aliis in machinis fabricandis vita nova donata vidit. Peritis nota sunt "Hydrodynamica" eius, in editione nova in maius exaucta. Etiam aliis innotuit oratio Societatis Britannicae in conventu Cantabrigiensi haud ita pridem pronuntiata, in qua primum studiorum mathematicorum historiam recentiorem dilucide delineavit; deinde etiam in studiis illis severis aliquid audendum, aliquid periclitandum esse dixit; denique rerum naturam nondum omnem esse exhaustam, sed miraculis etiam nunc esse plenam, quae scientiarum cultores per plurima in posterum saecula sint exercitura.

PROF. GEORGE DOWNING LIVEING, F.R.S., Fellow of St. John's.

Abhinc annos duo et sexaginta Cantabrigiam primum petivit vir intra proximum quinquennium in disciplina mathematica et in rerum naturae studiis honores summos adeptus, qui, post itinera sua Berolinensia, scientiae chemicae inter nosmet ipsos docendae sese strenue dedicavit, et Divi Ioannis in Collegio primam scientiae illius officinam Cantabrigiensem aedificandam curavit. Postea Universitatis professor nominatus, horum studiorum officinae amplissimae publice condendae summam diligentiam, summam operum exterorum experientiam, feliciter adhibuit. Lucis vero radiis spectri (ut aiunt) ope retexendis, et rerum naturae penetralibus examinandis, quot annorum labores dedicavit! quot discipulis studiorum uno tenore assidue peractorum exemplar quam pulchrum praebuit! In operibus bonis adiuvandis liberalissimus, in negotiis academicis partium liberalium defensor indefessus, per tot annos inter tantas rerum vicissitudines animum serenum, aequum, prudentem, modestum conservavit.

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[1] Cicero, "De Or.," i. 199.

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